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# Hydraulic Model Test for Dagachhu Hydropower Project, Bhutan

**Weir in Scale 1:35**  
**Desilter in Scale 1:15**

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## *Project description*

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## Dagachhu hydropower dam project

Thanks to its localization, in South-East of the Himalaya, Bhutan has a huge hydropower potential. 1500 MW are nowadays generated in hydraulic power stations all over the country, that is, according to the 2003 Water Resources Management



*Bhutan - country in the Himalaya Mountains*

Plan, only 5% of Bhutan total hydropower potential. However, the export of surplus was soon 45% of internal revenues to the government in 2008. Hydraulic infrastructures built in the last few years helped the country to develop, as it allowed a better access to electricity for the population and a growth of industrial sector.

Bhutan hydropower benefits not only itself, but also India, where surplus is exported. That is why Indian government has supported financially the last hydro projects, and accepted to back Bhutanese government in its new aim: 10 000 MW more produced in 2020. Governments chose together some of the 76 sites judged economically and technically feasible in the WRMP, to be laid out.

The project on the Dagachhu River is one of them. The power station should produce 114 MW. Despite its little size, considering the objective of 10 000MW, Dagachhu hydropower project has a major importance, as it was the first project with would be financed including private participation. Indeed, Bhutan Government having big debts due to its investments of the last years, a new source of funds was necessary.

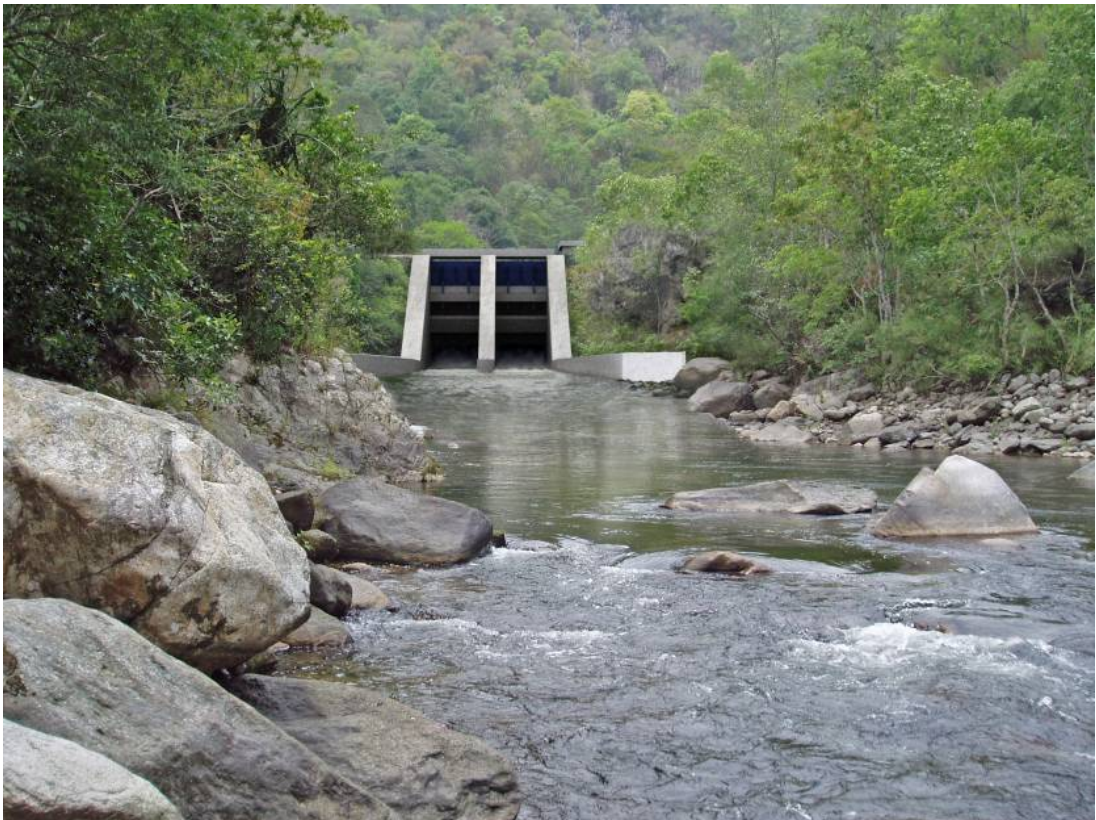
The area where the weir will be built is shown in photos in annex 1.

The Dagachhu Hydropower Corporation (DHPC) has been created by the national company Druk Green Power Corporation (DGHPC) to manage the building and the working of Dagachhu dam. It is advised by Bernard Ingenieure for all the dimension calculations and the simulations. Plans of the building are drawn by the society SNC-Lavalin, while the construction is made by the Hindustan Construction Company (HCC). IWI, with models tests, should propose a satisfactory design of the weir and the desilter.

## Scopes of Work

### 1. Weir model test (Scale 1:35)

- Assessment of approaching flow
- Confirm of the general layout of the structures
- Assessment and, if necessary, improvement of flow conditions along the sluice, overflow section and stilling basin
- Energy dissipation downstream of the weir (in the stilling basin)
- Determination of the stability of river bank and bank protection upstream and downstream of the structures
- Intake – sediment rejection
- Hydraulic performance of the intake gate during various discharges in the river
- Bed load movement through sluice and stilling basin



*Photomontage: weir view from the stilling basin*

### 2. Desilter model test (Scale 1:15)

- Evaluation of the flow pattern in the transition zones upstream and downstream and at the basins
- Performance with respect to extraction of sediments
- Efficiency of flushing devices





*Desilter Model Construction in the Laboratory*